

RENOVATIONS OF THE HAWAII FRUIT FLY PRODUCTION FACILITY AND TRANSITION TO TSL STRAIN

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Hawaii Fruit Fly Production Facility

**Facility Improvement to Efficiently Implement
Genetic Sexing Strains**



MISSION STATEMENT

HAWAII FRUIT FLY PRODUCTION FACILITY

**TO DELIVER A SECURE DOMESTIC SUPPLY
OF HIGH QUALITY, APPROVED STRAINS OF
STERILE MEDITERRANEAN FRUIT FLY TO
ENSURE RAPID RESPONSE TO ERADICATIVE
DEMANDS AND PREVENTATIVE RELEASE
PROGRAMS IN THE UNITED STATES.**

FACILITY IMPROVEMENTS

- Deficiencies
- Construction Projects
 - Timeline
 - Renovations
 - tsl implementation
 - Production Capacity

PARTNERING

- USDA, APHIS, PPQ, HFFPF
- HAWAIIAN ELECTRIC COMPANY (HECO)
- US DEPARTMENT OF ENERGY
- USDA'S ARCHITECT AND ENGINEERING GROUP

IDENTIFIED FACILITY DEFICIENCIES INCLUDE:

- AIR HANDLERS
- DUCT WORK & CEILINGS
- CHILLERS
- MONORAIL WHEELS
- FLOORS & WALLS
- FIRE ALARM
- AUTOMATION
- DIET DISPENSING
- WASTE WATER HANDLING

MAJOR PROJECTS

- ENERGY EFFICIENCY
- WASTEWATER HANDLING
- AUTOMATION

ENERGY EFFICIENCY

- ELECTRICAL COSTS
 - CONTINUE TO RISE
 - INEFFICIENT EQUIPMENT
 - BASE FUEL & ELECTRICAL RATES
 - FUTURE TSL REQUIREMENTS
- LAST 24 MONTHS MONITORING
 - KWH USE INCREASED 25% IN YEAR 2
 - PRICE INCREASE PER KWH: 15%

ENERGY SAVING AVENUES

- **JOINT STUDY**

- **THERMAL ENGINEERING & HECO**

- **RETROFIT PROJECTS**

- **CENTRIFUGAL CHILLERS**
 - **20 AIR HANDLERS**
 - **CHILLED WATER PUMPING SYSTEM**
 - **FLUORESCENT LIGHT FIXTURES**
 - **LIGHT SWITCHES**

Automation

- **An essential part of TSL implementation**
- **Reduces labor**
- **Reduces water**
- **Allows use of recycled water**
- **Reduces destruction**
- **Increases hygiene**
- **Increases accuracy**
- **Increases efficiency**
- **Partners with other technologies**

Automation Waste Diet & Tray Washing

- Currently, thousands of trays washed by hand each day
- It is one of the most important tasks in the mass rearing of medfly.
- Labor-intensive,
- Generates an enormous volume of wastewater.
- Local treatment plants are unable to accept such volumes, so wastewater is hauled away from the facility at the cost of more than \$320,000 per year.
- Tray washing can be readily automated, as demonstrated in other fruit fly rearing facilities in the world.



- A conveyor system, containing several stations can be integrated into an existing monorail system.
- The current tray washing cost of 57¢ can be reduced to 17.5¢ per tray.

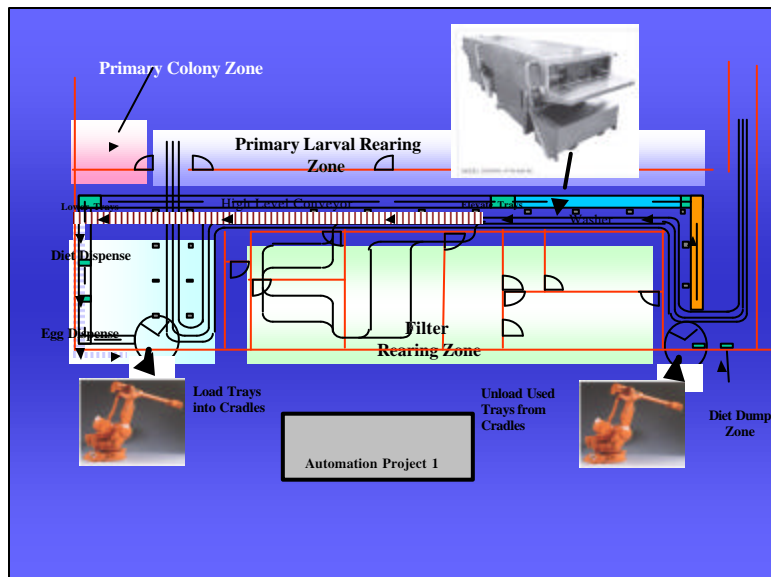
Automation Diet Dispensing and Egg Set

- Process initiates the production sequence
- Requires a large number of staff. Each day, diet (11 lbs./tray) is manually spread onto more than 1,000 trays and stacked into monorail cradles.
- Labor-intensive, time consuming and conducive to injuries.
- Stacking height currently limited by human reach (limits TSL productivity), will not be a limitation of automation, increasing production potential of the
- Diet dispensing and egg set can be automated through the integration of dispensing machines with existing diet mixers.
- Estimated that the current tray loading cost of 41¢ can be reduced to 16¢ per tray.



AUTOMATION AVENUES

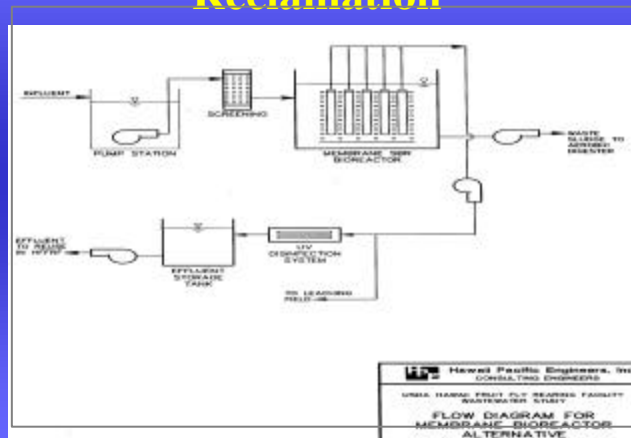
- PRECISION AUTOMATION, HECO AND THE USDA
- TRAY WASHING
- ROBOTICS
- CONVEYANCE
- DIET AND EGG DISPENSING



Waste Water Treatment and Reclamation

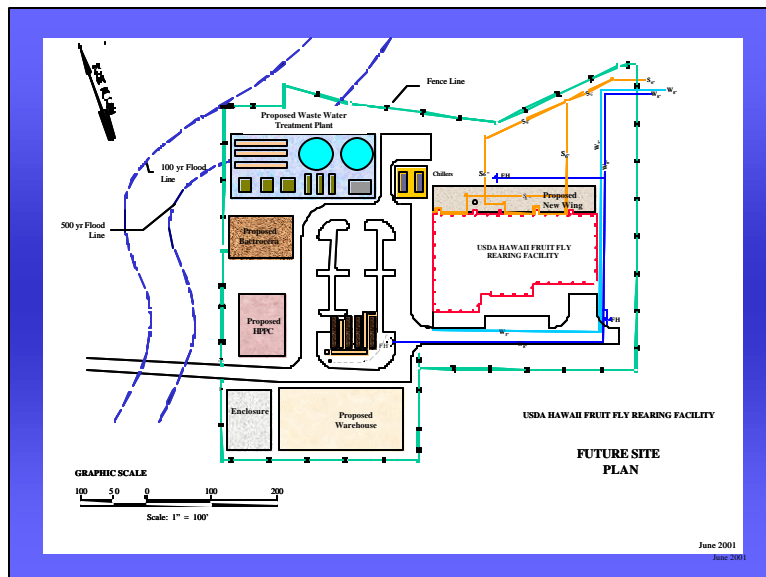
- HECO and Hawaii Pacific Engineers
- Membrane Bioreactor:
 - Self-sufficient
 - Small foot print
 - Allows recycling 70% of Water
 - Eases larval collection

Waste Water Treatment and Reclamation



POSSIBLE FUTURE CONSTRUCTION

- HFFPF EXPANSION
- WAREHOUSE & MAINTENANCE SHOP
- SCIENCE SUPPORT BUILDING
- MULTI SPECIES FRUIT FLY PRODUCTION BUILDING



IN CONCLUSION

YEARLY FUTURE VOIDED EXPENSES

- **ENERGY EFFICIENCY**
–\$250,000
- **WASTEWATER HANDLING AND
AUTOMATION**
–\$500,000

BENEFITS OF PARTNERING

- FACILITY RENOVATION AND IMPLEMENTATION OF CUTTING EDGE TECHNOLOGY
 - FACILITY AND EQUIPMENT
 - SHORT AND LONG TERM
 - BIOLOGICALLY
 - GENETIC SEXING STRAINS